

# **PROTECTING MEDICAL-TREATMENT CHAIR WITH AIR-CURTAIN SHIELD**

## **BACKGROUND OF THE PRESENT INVENTION**

### **1. Field of the Present Invention**

The present invention relates to a protecting medical-treatment chair with air curtain shield, particularly, a protecting medical-treatment chair with air curtain shield which can prevent the cross-infection due to air-borne germs or sputter, and provide a clean air environment for medical treatment to the patient suffering from pulmonary disease.

### **2. Description of Prior Art**

After the 911 terrorists attacks in the U.S. people of the world gradually took the potential hazard factors caused by the infection due to sputter and the air-borne bacteria seriously such as germs or virus or their metabolins. However, in hospitals and clinics, there were often the cross-infection due to sputter and the air-borne bacteria between doctors, nursing workers and patients caused by close contact with each other. Therefore, if a simple protecting medical treatment chair is invented to provide a dust-free and aseptic space enveloped by an air-hood, the cross-infection between doctors, nursing workers and patients in hospitals or clinics can be avoided if they sit on the chair.

On the other hand, the seriously increasing air pollution in recent years has resulted in increasing patients suffering from asthma or the pulmonary disease. Therefore, if a simple protecting medical-treatment chair is invented, a clean, dust and smoke-free air environment can be provided or maintained for giving medical-treatment or for reducing the rate of on-set of the patients with asthma.

## **SUMMARY OF THE PRESENT INVENTION**

The major purpose of the invention is to provide a protecting medical-treatment chair with air-curtain shield which applies the medical level air-suction and cleaning equipment to enable the functions of generating an air-curtain shield, air filtration and recirculation, and to provide or maintain a clean air environment without dust and smoke pollution.

The minor purpose of the invention is to provide a protecting medical-treatment chair with air-curtain shield which applies the medical level air-suction and cleaning equipment to provide or maintain a clean air environment without dust and smoke pollution for giving medical-treatment to the patients who suffer from the pulmonary disease, and need to stay in a clean air environment.

Another purpose of the invention is to provide a protecting medical-treatment chair with air-curtain shield which applies the medical level air-suction and cleaning equipment to enable the effect of push and pull on the air-flow screen surrounding the chair that can isolate the air or sputter exhaled by the patient sitting on the chair, and immediately send the air or sputter exhaled by the patient to the medical level air-suction and cleaning equipment for filtration, sterilization and recirculation to form the air-curtain shield with clean air so as to enable the function of preventing the cross-infection through air-borne germs or sputter between doctors, nursing workers and patients.

One extra purpose of the invention is to provide a specific construction which comprises a top-hood above the seat surface, an air suction slot formed at the corner of the seat surface. Clean air from the medical level air-suction and cleaning equipment flow downwardly from the front edge of the top-hood above the seat surface to form an air-curtain shield to provide isolating function and the down ward push effect which, together with the pull effect exerted by the same air-suction and cleaning equipment through the suction slot at the corner of the seat surface, produces a push and pull effect on the air flow, meanwhile, the hazardous bacteria are removed through the filtration effect of the medical level air-suction and cleaning equipment. With these functions the invention can be used for preventing cross-infection and providing medical treatment to the patients suffering from pulmonary disease.

### **BRIEF DESCRIPTION OF THE DRAWING FIGURES**

Fig. 1 is the aspect drawing of the protecting medical-treatment chair with air-curtain shield of the invention.

Fig. 2 is the sectional view and illustration of the protecting medical-treatment chair with air-curtain shield of the invention in operation.

Fig. 3 is the illustration drawing of the protecting medical-treatment chair with air-curtain shield especially used as waiting-chair in waiting-area for medical examination.

### **DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS**

As shown in Fig. 1 and Fig. 2 are the Protecting Medical-treatment Chair with Air-curtain Shield (10) which comprises a main-body (20) of the chair with air-curtain shield, one or more than one set of air-suction and cleaning equipment (medical level)(40).

The main-body (20) of the chair with air-curtain shield comprises a seat surface (21), a seat back (22), and the hood-wall (30) on either side of the seat surface. The bottom portion of the seat back (22) is connected to the rear edge of the seat surface

(21), and extends upwardly, then turns horizontally toward the front side to form the top-hood (23) above the seat surface with its front edge positioned beyond the horizontal position of the front edge of seat surface (21); also the hood-wall (30) are positioned on either side of the seat surface (21) and seat back (22). Further, both sides of the seat surface (21) and seat back (22) are blocked with the hood-wall to enable the main-body (20) of the chair to form a bag-shaped inner space. When the air flow (50) constructs a vertical air-curtain shield in vertical direction at the front side of the seat surface (21) of the main-body (20) of the chair the inner space of the chair is isolated from the surrounding environment; i.e. the hood-wall (30) has no any opening, and can completely and perfectly block both sides of the seat surface (21) and the seat back (22) that constructs the most preferred embodiment of the invention.

At the two corners along the front edge of the seat surface (21) the suction slots (27) are symmetrically positioned which can be shaped as “L” or “I” or in rectangular shape having angular cross-section with outer width greater than the inner width. A suction tube connector (29) is installed at the bottom side of each suction slot (27) to form the outlet of the suction slot (27), and is connected to the air-suction and cleaning equipment (40) through suction tube (43) to form negative pressure inside the suction slot (27), so that the air is sucked into the medical level air-suction and cleaning equipment (40) through the suction effect of the suction slot (27) for filtration and cleaning treatment before discharged for further purpose of use.

Also, the portion from the bottom of the seat back (22) to the front edge of the top-hood (23) is arranged to provide an inner cavity for air flow passage (24) with an air supply tube connector (28) installed on the end surface at the bottom of the seat back (22) to form the air inlet of the air flow passage (24) which is connected to the air-suction and cleaning equipment (40) through the air supply tube (44) so that the clean air filtrated and cleaned by the medical level air-suction and cleaning equipment can flow into the air flow passage (24) in the seat back (22) through the air supply tube connector (28); Moreover, at the bottom side of the top-hood (23) of the seat back (22) near the edge of the top-hood (23) an air outlet (25) is provided and arranged corresponding to the two air suction slots (27) at the corner of both sides of the seat surface (21). Since the air outlet is arranged into the shape of “┐”, the air stream flowing out will form an air-curtain shield covering the edge contour of the seat surface (21) and the suction slot (27) located at the corner on either side of the seat surface (21). Further, along the opening of the air outlet (25) several guide plates (26) are provided to enable a downward lamina flow air-curtain in vertical direction (50) by the guiding effect of the guide plates (26) when the air flow out of the outlet (25) so that an air-curtain shield can be formed in front of the main-body (20) of the chair for isolating the inner side of the main-body of the chair from the

outside.

The air-suction and cleaning equipment (40) in the present invention shall be the medical level air-suction and cleaning equipment which comprises an air suction inlet (41), an air discharging outlet (42) and an air filtration-sterilization unit such as filtrating screen and ultraviolet ray etc.. Between the air discharging outlet (42) and the air supply tube connector (28) on the main-body (20) of the air-curtain chair is connecting air supply tube (44), and between the air suction inlet (41) and the air suction tube connector (29) on the main-body (20) of the air-curtain chair is connecting air suction tube (43). These construct an air filtration and circulation system of the Protecting Medical-treatment Chair With Air-curtain Shield.

The air-suction and cleaning equipment (medical level) (40) may be installed in the space under the seat surface (21) or other concealed place, and may be controlled by induction type switch, for example, the infrared-ray switch may be arranged in the place surrounding the seat surface (21) or seat back (22) of the main-body (20) of the air-curtain chair. Therefore, when the user (60) sits on the main-body (20) of the air-curtain chair the air-suction and cleaning equipment (medical level) is started immediately, and when the user (60) leaves the main-body (20) of the air-curtain chair the air-suction and cleaning equipment (medical level) (40) is stopped immediately.

Now, refer to Fig. 2, when the user (60) sits on the Protecting Medical-Treatment Chair with Air-curtain Shield (10), the medical level air-suction and cleaning equipment (40) is started, and the clean air treated by sterilization and filtration unit of the medical level air-suction and cleaning equipment (40) is discharged from the air discharging outlet (42) into the air flow passage (24) in the main-body (20) of the chair through air-supply tube (44) and the air supply tube connector (28), and then the air, flowing through the air flow passage (24), flow out from the air outlet (25) on the bottom side of the top-hood (23) of the main-body (20) of the chair to form a downward air-curtain shield (50) in vertical direction in the front side of the main-body (20) of the air-curtain chair to isolate the inner space of the main-body (20) of the chair from outer space. Therefore the user sits inside the main-body (20) of the air-curtain chair shall not be affected by any outer environment that can prevent the cross-infection due to air-borne bacteria or through sputter. Further, in addition to the perfect isolation, the air, even sputter exhaled by the user of the chair can be rapidly removed from the inner space of the main-body 20 by the push and pull effect generated by the air flow stream (50) continuously flowing down in vertical direction and the negative suction pressure generated by the suction slot (27) on the seat surface (21), and then the air is sent to the medical level air-suction and cleaning equipment (40) for filtration and sterilization treatment to eliminate the hazardous bacteria, and is reused for circulation to form air flow stream (50). Therefore, a clean, dust and

smoke free environment can be provided in the inner space of the main-body (20) of the chair which can be used by the patients who need to stay in a clean air-environment for carrying out medical treatment against the pulmonary disease.

However, the suction slot (27) for generating the negative suction pressure can also be installed on the two armrests (31) of the main-body (20) of the chair. The inner cavity of the armrest is used as air flow passage which is connected to the suction inlet (41) of the medical level air-suction and cleaning equipment (40) by means of air suction tube (43) to construct another embodiment of the invention.

The protecting Medical-treatment Chair With Air-curtain Shield (10) is designed for the purpose of protection or giving medical treatment, and is suitable for daily living environment to be used by those who need clean air environment or those who suffer from asthma, or can be used in hospital or clinic as medical-treatment chair by doctor or nursing worker or the patient, or can be used as waiting chair in waiting area for medical examination as shown in Fig. 3, or can be used especially for collecting the phlegm test sample from patient, or can also be used by smokers to prevent the public being hurt by the second-hand smoke.